CEP SHORT TERM COURSE
On

Scientific Computing with MATLAB

(26th July - 30th July 2022)

Organized by

Department of Mathematics
Indian Institute of Technology Patna
Bihta, Patna, Bihar-801106

INTRODUCTION

Scientific computing is an essential tool that helps in solving problems in mathematics and engineering. MATLAB provides a strong platform for applying scientific computing to a relevant problem. There are several real world problems arising in sciences, engineering and interdisciplinary areas that need scientific computation and hence learning MATLAB will help in tackling these problems effectively and efficiently.

OBJECTIVES

This five-day CEP course intends to focus on both basic scientific computing tools and then rigorous learning in different areas such as Differential equations, Algebraic systems and data analysis. All these areas are important parts of any scientific study. Differential equations are one of the basic mathematical tools for modeling any system that is time dependent, and many a time, it is not possible to find closed form solutions and hence need to solve such equations via scientific computing is essential. Algebraic systems, mostly when they are bigger in size, require the help of scientific computing tools. Similarly, any research topic generates a huge amount of data. To provide a proper perspective to data, its analysis and representation are important. Thus, keeping all these aspects in mind the suitable program is designed where in a short span of time one can get exposure and experience of these topics. An extensive hands-on experience is also planned in form of practice labs.

COURSE CONTENTS

- Basics MATLAB operations & logical (if, while etc.)
- Plot command, graphing, data visualization
- Differential equations' solution and solvers
- Delay differential equation solvers
- Optimal Control problems and solutions
- Algebraic equations of higher dimension and solutions
- Matrix factorizations such as QR, LU and SVD etc.
- Data, its properties and statistical analysis, GUI development

TARGET AUDIENCE

This course is suitable for anyone interested in scientific computing in MATLAB. The contents are developed keeping in mind the undergraduate students, PhD scholars, early career researcher, and persons from industry who need to apply MATLAB to solve differential equation, algebraic equations or data analysis. After completing the course, it is expected the candidate should be able to apply their knowledge to real world problems.

RESOURCE PERSONS

1. Dr Nutan Kumar Tomar, Associate Professor, Department of Mathematics, IIT Patna
2. Dr Soumya Jyoti Ray, Assistant Professor, Department of Physics, IIT Patna
3. Dr Prashant Kumar Srivastava, Associate Professor, Department of Mathematics, IIT Patna

In addition, other instructors from IIT and industry may also participate.

COURSE COORDINATORS

Dr. Prashant Kumar Srivastava
Dr. Nutan Kumar Tomar

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Indian Institute of Technology Patna
Bihta – 801106
Emails: **pksri@iitp.ac.in, nktomar@iitp.ac.in**

HOW TO APPLY

Scanned copy of the filled in Registration Form should be sent to **pksri@iitp.ac.in** on or before **July 10, 2022**. Since, the number of seats is limited, early registrants will be given a preference.

PROGRAMME FEE

Industry Participants/ Faculty	8,000/-
Research Scholars/ Students	6,000/-
Students of IIT Patna	4000/-

Programme fee includes admission-cum tuition fee. A Certificate of participation from IIT Patna will be awarded to all participants after successful completion of the course.

FEE PAYMENT

The Participation fees for the CEP programmes will be accepted **only** via e-transfer/RTGS/ NEFT. Personal cheque will not be accepted in any case.

The fee may be sent by Bank Transfer into the following account with a scanned copy of the payment receipt being sent to **pksri@iitp.ac.in**

Name of the Account: Registrar, IIT Patna
Bank: State Bank of India,
Branch: IIT Patna, Bihta
Bank Account No.: 30957551934
MICR Code: 801002005
Swift code: SBININBB156
Beneficiary: Indian Institute of Technology Patna
Bank Telephone: 0612-3028062
IFSC: SBIN0017164
Account Type: Savings A/c

IMPORTANT DATES:

Last date of Registration	July 10, 2022
Last Date of Payment	July 10, 2022
Participant Confirmation	July 11, 2022

NOTE: *If the number of registered participants remains below 25, the program will be cancelled and the fee will be refunded*

ACCOMMODATION

The registration fee includes tuition fee and working lunch and snacks. There is a limited availability of accommodation in IIT Patna hostels for student participants at an affordable rate, which will be offered on a first-come-first served basis. Besides there are several hotels and guest- houses around IIT Patna where the participants may stay during the course.

ABOUT IIT PATNA

IIT Patna is an institute of National importance by an Act of the Indian Parliament in 2008. It is ranked 21 among engineering colleges in India by the National Institute Ranking Framework (NIRF).

IIT Patna's campus is located at Bihta, 35 km from Patna and 20 km from Ara, at a 501 acres site. The nearest railway station is Bihta, 2 km from the campus. IIT Patna has good road connectivity to and from Patna and Ara. Regular bus services have been provided by the Govt. of Bihar from Gandhi Maidan, Patna to IIT Patna campus. The nearest airport to reach IIT Patna campus is Jai Prakash Narayan Airport, Patna.

COURSE REGISTRATION

Online link to the registration form can be accessed here. Please submit the programme fee as required before submitting the form.

https://forms.gle/nGunrNEqoDicEywm6

SCHEDULE OF PROGRAMME

Day / Detail	10.00AM-11.30AM	Coffee break 11.30 AM - 12.00 PM	12.00PM-01.00PM	Lunch break 01.00 PM - 02.00 PM	02.00PM-03.30PM	Coffee break 03.30 PM - 04.00 PM	04.00PM-05.00PM
July 26	Lecture-1		Lab-1		Lecture-2		Lab-2
July 27	Lecture-3		Lab-3		Lecture-4		Lab-4
July 28	Lecture-5		Lab-5		Lecture-6		Lab-6
July 29	Lecture-7		Lab-7		Lecture-8		Lab-8
July 30	Lecture-9		Lab-9		Lecture-10		Lab-10